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NOTES ON FISHES IN THE ZOOLOGICAL MUSEUM  
OF STANFORD UNIVERSITY. IX. A NEW  
SPECIES OF *SALARIAS*, WITH A KEY  
TO THE PHILIPPINE SPECIES.

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The blennies belonging to the genus *Salarias* are herbivorous fishes of tropical reefs and rocky shores. They are abundant in the Indian and Pacific Oceans, where they range north to Japan and south to Tasmania and the coast of Natal. Some of the Indo-Pacific species are very widely distributed, occurring from the east coast of Africa to the Marquesas Islands.

The identification of *Salarias* species is often difficult. Many kinds lose their characteristic colors and markings after death, or have them greatly altered. The difficulty is enhanced by the fact that in a number of species the sexes are very unlike in appearance, while in closely related species the sexes may be alike in every respect except the presence of a crest. Where the sexes have entirely different color patterns or markings, either of body or fins, or both, their determination is easy as long as the markings remain.

Males are usually distinguished by the cutaneous median crest on the occiput, by much thicker lips, by the presence of canines, and by a dusky spot or two on the upper part of the membrane between the first and third dorsal spines. However, the student must realize that no single character may be depended upon for determination. While the crest is usually a male character, it is developed in both sexes sometimes, and in other species is never developed at all. A few species have canines present in both sexes, while others never have them, and they may be entirely absent from species or males that usually have them. Characters that are fairly constant are the number of dorsal and anal spines and rays, the shape of the dorsal and whether it is free or attached to the caudal, the crest, the presence or absence and character of tentacles on nape, eyes, and nostrils, and whether the lips are entire or crenulate.

A study of the large collection of *Salarias* made during my stay in the Philippines from May to October, 1940, has compelled a revision of

Philippine species and the publication of a new key. One new species is presented, and one species is relegated to synonymy. No doubt further intensive collecting will reveal some of Bleeker's East Indian species in the Philippines; we may expect several more species of *Salarias* ultimately in Philippine waters.

#### SALARIAS Cuvier.

Small blennies with a naked and usually slender, elongate body; the numerous movable teeth are set on the gums; a curved canine may be present on each side of the lower jaw, behind the other teeth. Simple, fringed, or divided tentacles may be present on the eyes, nape, and nostrils. A median longitudinal crest may be present on the head; so far as known only males of some Philippine species ordinarily have it, while other kinds never have a crest. The dorsal may be entire, or more or less deeply notched between the spinous and rayed portions, and may be free from the caudal or more or less attached to it. The jugular ventrals are of a spine and 2 or 3 rays. The wide gill opening forms a free fold across the isthmus.

#### *Salarias martini* Herre, new species.

Dorsal XIII—18 or 17, rarely 19; anal 18 or 19, or I or II—18—19; pectoral 14; caudal 3—9—3, rarely 2—10—2. A very few specimens have 12 dorsal spines, and one young specimen about 35 mm. long has 14 spines.

The proportions, as in most species of *Salarias*, vary greatly according to the size and condition of specimens. In large adults the depth, length of head, and of caudal fin, are usually sub-equal. The depth of such specimens is from 4 to 4.8, the head 4 to 4.7, the rounded caudal 4.3 to 4.85 times in the length. Young specimens are often slenderer, their depth being up to 5.6 times in the length. The eye is 4 to 4.8, the snout 2.4 to 2.85, the least depth of the much compressed caudal peduncle about 2.4 times in the head.

The body is elongate, the anterior portion moderately rounded, the posterior half compressed, the head large and thick, with a vertical or nearly vertical broad blunt snout. The eye is high up and as far forward as possible, lying entirely within the anterior third of the head; the inter-orbital width is half or less than half an eye diameter. The mouth is large, inferior, without canines, the lips entire; the maxillary extends to a vertical from the hind margin of the eye, or usually beyond some distance. The ocular tentacle is more or less marginally fringed, and usually equals the eye, but may be only half an eye diameter to more than the eye; the fimbriate nasal tentacle has 4 or more filaments; there are no nuchal tentacles. Males have a thin skinny crest of moderate height on the head.

The dorsal is deeply notched, and continues to the caudal base but is not adherent to the caudal itself; the anterior half is lower than the hind half, its longest spines 8.5 to 10 times in the length; the dorsal rays are highest posteriorly, the longest 5 to 6.5, the anal height 7 to 10 times in the length. Occasionally a specimen has the fins much higher. In adults the anal is incised, leaving the tips of the rays free. The pectoral is 5 to 6 times in the length or 1.2 to 1.35 times in the head.

The color in alcohol is light reddish brown with 7 pairs of blackish cross bars, and a blackish spot on the caudal peduncle; usually the entire head is dusky and the anterior cross bars obscured, or the whole fish may be more or less bluish dusky. The dorsal and caudal are light brown to blackish, the posterior half of the dorsal with numerous darker lines curving upward and backward; the anal is uniform light brown to nearly black. In females and young males the dorsal, anal and caudal have a white edge, but in large males this may disappear, or only the second half of the dorsal retain the white margin.

Described from the type, a male, 119 mm. long, and 226 other specimens, ranging down to 27 mm. in length; they were taken from a reef at Estancia, Panay, Philippine Islands. Unlike most species of *Salarias*, the males are as large, or even larger, than the females. Some females from 70 to 104 mm. in length were in breeding condition. This species is close to *Salarias edentulus* and *Salarias dussumieri*, but is readily separated from them both. It lacks the nuchal tentacles of *Salarias edentulus* and has fewer fin rays than either *S. edentulus* or *S. dussumieri*. Both these species are also sexually dimorphic, while the sexes are alike in *S. martini*, except for the masculine crest.

I take pleasure in naming this handsome blenny for Mr. Claro Martin of the Philippine Division of Fisheries, whose generous aid made my stay at Estancia both pleasant and profitable.

#### SALARIAS DUSSUMIERI Cuv. & Val.

*Salarias dussumieri* Cuv. & Val., Hist. Nat. Poiss., vol. XI, p. 229, 1836.

Playfair, Fishes Zanzibar, p. 77, pl. IX, figs. 6 and 7, 1866.

*Salarias zamboangae* Evermann and Seale, Proc. U. S. Nat. Mus., vol. 31, p. 512, fig. 4, 1907.

Herre, Phil. Journ. Sci., vol. 70, p. 359, 1939.

Study of a series from the Andaman Islands quickly showed that *S. zamboangae* is a synonym of *S. dussumieri*. The sexes are markedly different in appearance. Playfair's figures are excellent, but he has curiously reversed the sexes. Evermann and Seale had 3 males, one of which was described and figured. I have had 168 Philippine specimens of both sexes and all sizes from 23 to 109 mm. length, from the following localities: Nasugbu, Batangas Prov.; Calapan, Mindoro; Basis and Dumaguete, Oriental Negros Prov.; Estancia, Panay; Kolambugan, Lanao Prov.; Patalon Plantation, Zamboanga Province. I have also had one from Lembeh Strait, Celebes, and 10 from the Andaman Islands.

#### KEY TO THE PHILIPPINE SPECIES OF *Salarias*.

(Based on preserved specimens.)

##### 1. Dorsal entire and not divided.

- A. Uniformly dark brown or black, with caudal and pectoral sometimes yellow; last anal and dorsal rays often elongate, reaching last half of caudal; dorsal XII—17 to 19; anal 19 or II—18 or 19.....1. *SALARIAS FUSCUS*

AA. Not uniformly dark brown or black.

B. Dorsal free from caudal; 2 or 3 rows of elongate brown-edged white spots on sides and small circular ones on head; no blue or violet-brown spot on each side of throat; usually small canines in lower jaw; minute simple tentacles on eye, nape, and nostril; dorsal XII—XIII, 19 to 22; anal II—20—22 or I—23 ..... 2. *S. NITIDUS*  
 [*S. albo guttatus*, with a large violet-brown spot on each side of the throat is a Polynesian species.]

BB. Dorsal attached to caudal; no canines.

C. Brown, thickly sprinkled with blue-black dots; dorsal and caudal cross-banded with brown spots and black dots; broad, palmately fringed tentacles on eye and nape; dorsal 29—30; anal I—19 or 18..... 3. *S. CERAMENSIS*

CC. Brown or bluish brown with 6—8 wide dark cross bands; black dots and dashes above pectoral, passing into lengthwise lines along the side; large circular white or pale spots (blue in life) below lines and on pectoral base; broad fringed tentacles on eye, nape, and nostril; dorsal XII—19 or 20; anal I—19 or 20..... 4. *S. FASCIATUS*

2. Dorsal more or less deeply notched.

D. A longitudinal skinny crest on top of head.

E. Dorsal XV or XIV—18 or 19; anal II—19 or 20; ocular tentacle stout, marginally fringed, nasal tentacle fringed, none on nape; no canines; light brown with 8 broad dark cross bars, divided below, and a band at caudal base..... 5. *S. COLEI*

EE. Dorsal with XII or XIII spines, by exception XI or XIV.

F. Two rows of short blue or pearly bars on side; a circular blue-black spot at upper angle of opercle; often 1 or 2 blue or black spots behind eye; dorsal XII, 20 or 21; anal I—II, 20 or 21; a long simple tentacle on eye; lower jaw with canines..... 6. Males of *S. PERIOPHTHALMUS*

As above, with 4 to 8 longitudinal brown lines from near tip of pectoral to above middle of anal.....

Males of *S. PERIOPHTHALMUS* var. *VISAYANUS*

FF. Without rows of blue or pearly bars on sides.

G. 4 to 10 dark or black longitudinal lines on sides; upper lip crenulate; no tentacles at nape.

H. Pale brown, with 5 to 7 black or very dark lines along side, changing posteriorly to dots and dashes; caudal barred with rows of black dots; dorsal slightly attached to caudal; canines present or absent in lower jaw; dorsal XIII—20 to 23; anal I or II—20 to 24..... 7. Males of *S. CAUDOLINEATUS*

HH. Brown or leaden with 6 to 10 black lines along sides, becoming 4 to 6 posteriorly, sometimes becoming spots or dots near the caudal; no canines; dorsal attached to caudal, XI or XII—22—24; anal II—23 or 24..... 8. Males of *S. LINEATUS*  
 [*S. bilitonensis*, an East Indian species, is to be expected and

is likely to be confused with *S. lineatus*. Dorsal XII—20 to 21; anal II—20—21; posterior canines in lower jaw; about 10 dusky lines along side; blue stripes below and behind eye; large blue spot on opercle.]

GG. No dark lengthwise parallel lines on sides.

I. Roseate, with many violet crossbands wider than interspaces, becoming irregular vertical lines posteriorly; in alcohol often becoming violet-brown or brown; canines present or absent in lower jaw; dorsal XIII—19 to 21; anal I—21 or 22 or I or II—19 to 20.....9. *S. OORTI*

II. Not rosy with violet cross bands.

J. A pair of small or minute tentacles on nape.

K. Two rows of white dots on sides, or dots in curved vertical rows, and blue dots on sides of head; all dots often brown in preservative; dorsal free, ending before caudal, XII—15 to 17, or XIII—17 or 18; anal I or II—16 to 18; 6 pairs broad forked dark crossbands, extending on basal half of dorsal; lower jaw with canines.....10. Males of *S. BILINEATUS*

KK. No white dots on sides; no canines; dorsal attached to caudal, XIII—19 to 21; anal I (rarely II) 20—22, very rarely 23 or 24; ocular tentacle small, simple; nasal tentacle very small, of 4 filaments; brown, usually with darker cross bars; anal with 2 rows of bluish spots, or uniform; a diagonal dark bar behind eye, often disappearing; sexes markedly different.....

11. Males of *S. EDENTULUS*

JJ. No tentacles on nape; dorsal free of caudal, rarely slightly attached.

L. Dorsal XIII, rarely XII—17—18, rarely 19; anal 18—19 or I or II—18—19; no canines; color reddish brown with 7 pairs of blackish cross bars and a spot on caudal peduncle; orbital tentacle stout, marginally fringed; nasal tentacle of 4 or more filaments; sexes alike except for crest on males.....

12. *S. MARTINI*

LL. Dorsal XII, seldom XIII—20 to 22; anal I, 23 or 24, or II—21 to 24, or III, 22; fringed orbital tentacle equal to or more than eye; nasal tentacle small, bifid or trifid; 7 double brown cross bars, and usually 2 rows brown dots on lower half of body posteriorly; a blackish spot between first and second or third spines; usually a clear band along middle of rayed dorsal; upper part of rayed dorsal with diagonal rows of spots, dots, or zigzag lines, continued on upper half of caudal.....

13. Males of *S. DUSSUMIERI*

DD. No crest on the head.

M. Upper lip crenulate; dorsal free from caudal; orbital tentacle large, fringed.

N. Pearly bands with dark margins on snout, sides and underneath head; in preservative the dark lines remain, extending downward from eye; canines present or absent; nasal ten-

- tacle minute, simple; no tentacles on nape; dorsal XIII—15 to 18; anal I—17 to 19 or II—16 to 17.....14. *S. FRENATUS*
- NN.* Sides mottled brown, with row of white spots below lateral median line; a black spot above pectoral base and dark streak behind eye; short fringed tentacles at nape and nostrils; dorsal XII or XIII, 14 to 16; anal I or II—16 or 17.  
15. *S. MARMORATUS*

*MM.* Upper lip entire.

- O.* A purplish or brown spot or ring on each side of throat; body pale brown, with pale crossbands, forked below; a row of 15-20 black dots below dorsal, or irregular rows of black dots on upper half of body; 1 or 2 large circular white or pale blue spots on pectoral base; canines absent or present; dorsal XI or XII—17 or 18; anal I—18 or 19.....16. *S. GUTTATUS*

*OO.* No purplish or dark spot or ring on each side of throat.

- P.* Sides with 2 rows of short blue or pearl bars; a circular blue or black spot behind and bar below eye; a small canine in lower jaw; orbital tentacle small, simple; dorsal XII—20 or 21; anal I or II—20 to 21.....

6. Females of *S. PERIOPHTHALMUS*

Also with 4 to 8 brown lines from near pectoral tip to above middle of anal.....

Females of *S. PERIOPHTHALMUS* var. *VISAYANUS*

*PP.* No blue or pearl bars along sides.

*Q.* Body with longitudinal dark or black lines on sides.

- R.* Anterior half with many black dots, passing into brown or black lines on posterior half; anal with 2 black lengthwise stripes; small canines in lower jaw; tentacles on nape very small; orbital tentacle large, fringed; dorsal XIII—15 to 17; anal II—16 to 18.....17. *S. ANEITENSIS*

*RR.* Anterior half not covered with black dots. 4 to 10 dark lengthwise lines on sides; upper lip crenulate; no tentacles at nape.

- S.* Pale brown with 5-7 black or very dark lines along side, breaking up into dots and dashes posteriorly; caudal barred by rows of black dots; anal rays with white tips; orbital tentacle slender, pointed, usually less than eye; dorsal slightly attached to caudal, XIII—20 to 23; anal I or II—20 to 24....

7. Females of *S. CAUDOLINEATUS*

*SS.* Brown or leaden with 6 to 10 black lines on side, reduced to 4-6 posteriorly, sometimes becoming spots or dots near the caudal; orbital tentacle small, finely fringed; dorsal attached to caudal, XI or XII—22 to 24; anal II—23 to 24.....

8. Females of *S. LINEATUS*

*QQ.* Without 4 to 10 lines along each side; upper lip entire.

- T.* Reddish brown, with several rows of short blackish-brown bars and spots on sides; a simple tentacle on eye and a small divided nasal one, none on nape; a minute canine in lower

jaw; dorsal free of caudal, XIII—19 or 20; anal I—19 or 20.

18. *S. INTERRUPTUS*

*TT.* Not as above.

*U.* Pectoral clear, with 3 transverse rows of brown dots, or rarely spots; a row of red-brown spots above anal and 2 to 4 rows posteriorly; dorsal and caudal clear, with 4 rows of red-brown spots; males with a small canine; ocular tentacle simple, nasal one bifid or trifid; none on nape; dorsal free of caudal, XIII—19 or 20, rarely XII—18; anal I—19 to 21.

19. *S. DEANI*

*UU.* Pectoral not as above; no canines in lower jaw.

*V.* Dorsal free from caudal.

*W.* Minute simple tentacles on nape, eye, and nostril; dorsal XII—19 or 20; anal II—20; whitish with 7 brown spots along middle of side, each containing 3 or more conspicuous black dots; a row of prominent black dots along lower part of side.

20. *S. FOWLERI*

*WW.* No tentacles on nape; dorsal XIII (rarely XII)—17 or 18, rarely 19; anal 18—19 or I or II—18 to 19; reddish brown, with 7 pairs of blackish cross bars and a spot on caudal peduncle; orbital tentacle stout, marginally fringed; nasal tentacle of 4 or more filaments; no canines.....

12. Females of *S. MARTINI*

*VV.* Dorsal attached to caudal.

*X.* Small tentacles on nape; many reddish or dark brown dots or small spots all over body, dorsal, caudal and pectorals; orbital tentacle small; nasal tentacle very small, usually of 4 filaments; dorsal XIII—19 to 21; anal I—20 to 22.....

11. Females of *S. EDENTULUS*

*XX.* No tentacles on nape; 7 double brown cross bars, and 2 rows of brown dots on lower half posteriorly; dorsal rays and caudal barred with brown dots, or with diagonal zigzag lines connecting dots; nasal tentacle small, bifid or trifid; orbital tentacle fringed, equal to or more than eye; dorsal XII, seldom XIII—20 to 22; anal I—23 or 24, or II—21 to 24; or III—22.

13. Females of *S. DUSSUMIERI*